

Mobile Satellite Ventures

Presentation to International Bureau
June 22, 2004



Non-forward-band operations

- MSV has asked the FCC to leave open the option for MSS licensees to make a showing in an application that non-forward-band operations can be conducted in a manner that is consistent with the interference parameters established for forward-band operations
- MSV is considering the use of TDD for certain applications, recognizing that it would need to first seek and receive specific approval for such operations
- MSV Recon Petition at 23; MSV Reply to Inmarsat Opposition to MSV Recon Petition at 10.



Non-co-channel sharing

- MSV has asked for the same flexibility as S-band MSS licensees to the extent that it does not share co-channel spectrum with other L-band MSS systems that are visible from North America
- Roughly 70% of the spectrum coordinated by MSV and MSV Canada is not shared co-channel with any other visible satellite system; we recognize, however, that this percentage may decrease
- If and when coordination results in additional co-channel sharing, MSV's facilities will have the necessary frequency agility to adjust without any hardware changes
- MSV Opposition to Inmarsat Recon Petition at n.13; MSV Reply to Inmarsat Opposition to MSV Recon Petition at 4; MSV Nov. 3 ex parte letter at 3; MSV ATC Application at 16-17 and Appendix G

- As the vocoder information rate changes from R_1 bps to R_2 bps, the output power of the MT changes by $10\log(R_2/R_1)$ dB.
- Thus, for example, if the full-rate vocoder is providing to the MT an information rate of 13 kbps ($R_1 = 13$ kbps) and the half-rate vocoder information rate is 5.8 kbps ($R_2 = 5.8$ kbps) the output power of the MT, as it switches from full-rate to half-rate, will change by $10\log(5.8/13) = -3.5$ dB.
- Independently of the air interface protocol that MSV will use (GSM, cdma2000, or W-CDMA), MSV's MTs will use a half-rate vocoder every time the output power of the MT in full-rate mode equals or exceeds $P_{\text{MAX}} - 3.5$ dB.
- Once in half-rate mode, the MT will remain in half-rate mode until its output power equals or becomes less than $P_{\text{MAX}} - 7$ dB.
- MSV Recon Petition at 14 & App. B; MSV Reply to Inmarsat Opp. to MSV Recon Petition at 5 & Annex § 3; MSV ATC Application at 13-15 & App. C; MSV Response to Inmarsat Opposition to MSV ATC Application at 9-10.



Interference cancellation spectrum needs

- Ground-based interference cancellation does require additional feederlink capacity
- MSV expects to attain the necessary capacity through spatial diversity (i.e., deployment of multiple earth station gateways)
- The feederlink access MSV has requested in its pending application, when used with 3-4 gateways, is sufficient to meet these needs. (MSV November 18th Amendment to Replacement Satellite Application (File No. SAT-AMD-20031118-00335); MSV February 9th Amendment to Replacement Satellite Application (File No. SAT-AMD-20040209-00014).)

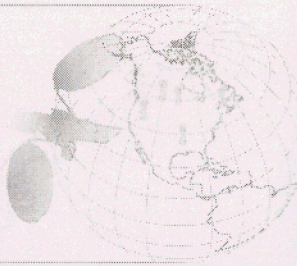


Compliance with requirement for 18 dB of structural attenuation

- Using normal cellular/PCS design engineering, every ATC cell will be engineered to accommodate a minimum of two propagation anomalies:
 - Signal attenuation due to structural attenuation (MT inside of a building)
 - Signal attenuation due to shadowing/blockage (MT behind a building)
- The system design will ensure that an MT that is behind a building (totally blocked and with no line-of-sight to the base station tower) will be able to communicate without increasing its power beyond that budgeted for 18 dB of structural attenuation.
- MSV Opposition to Inmarsat Recon Petition at 4-5 & Appendix A; MSV ATC Application at Appendix E.



- The reasonableness of this threshold for co-channel ATC is demonstrated by the following:
 - current L-band coordination is based on as much as 50% $\Delta T/T$
 - facilitating MSV's shift to its next-generation system is the only way to permit continued co-channel sharing with Inmarsat's next generation satellites; MSV's existing satellite METs would cause over 700% $\Delta T/T$ to Inmarsat's I-4 satellites
 - MSV's next-generation system will cause in the aggregate no more than 12% $\Delta T/T$ to Inmarsat's I-4 satellites (inclusive of 6% $\Delta T/T$ for ATC)
- The Commission has recognized that 6% $\Delta T/T$ (0.25 dB rise in the noise floor) is internationally accepted as the threshold for coordination between satellites (*ATC Order* ¶ 164). Moreover, the Commission has held that 25% $\Delta T/T$ (1 dB rise in the noise floor) is "not indicative of harmful interference." *UWB Recon. Order* ¶ 77.
- MSV Recon Petition at 9-14 & Appendix A; MSV Reply to Inmarsat Opposition to MSV Recon Petition at 3-5 & Technical Appendix; MSV Nov. 3 ex parte at 3; MSV ATC Application at Appendix E, I



Interference cancellation

- The requested simulation incorporating at least one MSS antenna beam and all co-frequency, co-coverage ATC cells, and a representative population of METs, will be prepared and presented within 1 week
- MSV is willing to license its interference cancellation patents to Inmarsat, but Inmarsat will not need to use interference cancellation technology unless it also chooses to deploy ATC; deployment discussions with Inmarsat have been minimal
- MSV Reply to Inmarsat Opposition to MSV Recon Petition at 6 and Technical Appendix; MSV ATC Application at Appendix F; MSV Response to Inmarsat Opposition to MSV ATC Application at 17-18.



Measuring interference to Inmarsat METs

- the test plans, procedures, and data are supplied in: MSV Recon Petition at Appendix C; MSV ATC Application at Appendix J.
- the 1 dB compression point of the LNA is the standard measure, as indicated by the ARINC specification
- MSV Recon Petition at 16-17 and Appendix C; MSV Opposition to Inmarsat Recon Petition at 9-11 & Appendix B; MSV Reply to Inmarsat Opposition to MSV Recon Petition at 7-8 and Technical Appendix; MSV ATC Application at Appendix J.

ATC operation outside the United States

- MSV has requested an increase in the extent to which it is permitted to operate ATC inside the United States if it holds constant the total amount of frequency reuse permitted throughout North America, on which the FCC's interference analysis is based
- The FCC's licensees (MSV and MSV Canada) will control the operation of ATC throughout North America; no base stations will operate on MSV's or MSV Canada's spectrum outside their control
- MSV Recon Petition at 6; MSV Reply to Inmarsat Opposition to MSV Recon Petition at 6 & Technical Appendix.

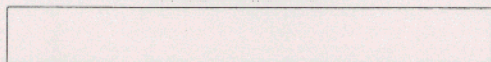
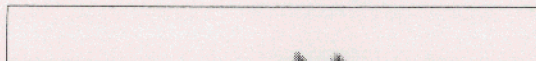
May 20, 2004

MSV's Next Generation System

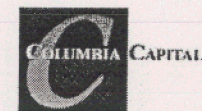
Ubiquitous Mobile Satellite Service



Ownership and Management



Telcom
Ventures, L.L.C.



- Operating investors: broad experience developing and operating mobile and satellite systems
- Financial investors: extensive investments in communications and satellite enterprises with billions of dollars under management
- Management: experience includes operations of satellite and wireless businesses